

looks through a collection of smaller lizards preserved in alcohol will scarcely gain an idea of the splendour of colour that many of the faded carcasses may exhibit in life. At any rate, for the purpose of an exhaustive study of Lacertilia the observation of living material can be much less easily dispensed with than in the case of the Ophidia. It would therefore be desirable that such zoological gardens as seek to advance science should direct their attention more than hitherto to the importation of the first-mentioned animals. With the commercial relations that Germany possesses a successful result should not be difficult of attainment, and should scarcely entail any considerable monetary sacrifice.

LVI.—*The Poisonous Snakes of British Guiana.*

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IF an ordinarily well-informed person be questioned as to the abundance or paucity of poisonous snakes in the Colony, no doubt the answer would deal rather with swarms than with a few, with the implication not only of numbers of any one particular kind, but also of many different species. And yet, as a fact, there are only about eight well-marked different species, of which two pit-vipers only are of such common occurrence as to present some element of dread to general travellers. In the open savannahs or cleared lands and on the sparsely clumped sandy wastes the rattlesnake is likely to be encountered, while in the forest itself or adjoining lands the labarria (known variously in different districts as Jararaca or Fer-de-lance) takes its place.

Of the remaining six species two are pit-vipers and four coral-snakes; but while, from their general size and character, the pit-vipers and one of the coral-snakes are certainly to be feared if met with, the other three seem to be usually altogether inoffensive creatures, and, in fact, much less ready or more disinclined to bite if irritated or handled than the generality of the common harmless snakes.

In using the term poisonous snakes it must be understood to refer only to those special forms which, from the perfection of the poison-apparatus, are able to cause serious injury or death to man and other large mammals. Such are the vipers and those members of the Colubrine division which bear

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anterior, grooved, or perforated fangs in connexion with the poison-glands. The members of a very large section of what are commonly termed harmless snakes are, however, really poisonous to a certain extent, possessing grooved *posterior* fangs, the bite from which is capable of paralyzing or killing the small prey on which they feed. On man this bite produces, at any rate in certain cases, an effect quite independent of the mechanical injury. This the writer personally experienced in the case of the common species of *Erythrolamprus* (*E. asculapii*=*E. venustissimus*), as recorded in 'Timohri,' vol. vi. new series (1892), p. 174. Three bites from the snake were received on the first finger, the posterior fangs being driven down deeply into the flesh each time, and after a short interval very considerable swelling and severe pain resulted, which was only relieved after about four hours, though the place was tender for a much longer time.

A similar effect on man is certainly produced by the bite of some Colubrine snakes which are destitute of grooved teeth. This has been directly noted by the writer in the case of two species with enlarged elongated posterior teeth, namely *Xenodon severus* and *Helicops angulatus*, where the teeth were driven deeply down into the flesh, and it would appear that ill effect is only caused by a large wound of a great degree of penetration admitting matter from the buccal glands, which would be impossible in a bite of slight or only moderate depth. An interesting relation between the two groups is seen in forms of the common species of *Erythrolamprus*, in which certain specimens are destitute of the groove on the posterior fangs.

The foregoing cases may serve to explain the peculiarity of the very large number of instances in which persons have been said to have been bitten by the common forest pit-viper or labarria and have recovered, and the extreme simplicity of the remedies used, such, for instance, as sugar and salt, paraffin oil, onion poultice, external application of ammonia, and other such substances, some of which may certainly be efficacious in allaying pain and lessening inflammation, but would have no real effect in dealing with a case of a lethal dose of snake-poison, especially after the more or less long intervals which usually elapse before such applications can be made. In certain cases, no doubt, the snakes may have been labarrias whose glands may not have been fully charged and whose bite would therefore not inject sufficient poison to kill; but in the great majority of cases it may be taken for granted the snakes were really not deadly, though perhaps capable of producing a certain amount of inflammation and more or less

severe pain by means of the enlarged posterior maxillary teeth, whether grooved or not.

To those who have an exact knowledge of snake-structure the matter is simple enough, but to the ordinary mind every dark snake is likely to be a labarria; and whether the nature of the fangs be rightly determined or not, the deadliness of the serpent would be regarded as evident even before inflammation and severe pain began.

In the case of the other common pit-viper, the rattlesnake, there is no such doubtfulness of identification, the rattle affording a certain means; and it is noteworthy that while one seldom or never hears here of a case of recovery from the bite of a rattlesnake unless some such certain method of treatment as amputation of the part has been resorted to, the reputed cases of recovery from the bite of the labarria are as common as the remedies employed are inefficacious for the purpose.

The species of rattlesnake (*Crotalus terrificus*) which is found in the Colony is commonly distributed over tropical and subtropical America, ranging from Texas and New Mexico to Northern Argentine. Specimens vary somewhat in tint and markings, at times being very dull-coloured and at others quite bright and striking. The brown ground-colour is usually marked on the neck by two black lines which pass into a series of dark rhombs with lighter centres along the back, the whole being outlined by a series of yellow or paler scales; and the scales are tuberculate and give a very rough aspect to the skin. Owing to the peculiar markings the skins are in great request for pouches, purses, belts, and other such objects—neckties even being at times prepared from them.

A peculiar feature in these and the other American vipers is the pit situated on each side of the face below and between the nostril and the eye, and which has secured for them the distinctive title of "pit-vipers," though its function is by no means evident.

The most characteristic feature of the species is, of course, the rattle, which, as is well known, is made up of a number of separable three-lobed pieces, closely packed together and interlocked by the incurving of the first lobe of each piece over the second lobe of the preceding, which allows the free movement of each, with the resulting shrill sound. Detailed reference to the structure and development of the peculiarities of this appendage is, however, unnecessary here, since in vol. v. new series, 1891, of 'Timehri' the matter has been already dealt with; but it may be as well to point out that the popular idea that a new ring is added each year, and

that therefore the number of rings give the age of the snake, is quite a mistaken one. Young rattlers are observed to exuviate on an average about every two months, and adults at times varying from three to five months under normally healthy conditions. Moreover the rings observed on a rattle vary entirely according to the number of pieces which have been broken away by damage from contact with sticks, stones, and other such objects. The older and more delicate pieces invariably get broken off, and those that remain represent only the harder and denser pieces which have been added during the most recent exuviations. The number present therefore is purely accidental.

As already mentioned, this is the commonest of the venomous snakes in the cleared or savannah lands. They will be found occasionally in cultivated fields, under or in the houses of the settlements, or along the paths, and are more frequently met with in open sandy and rocky ridges and wastes than in the actual swamps. Open lands with low scattered bushes are much more preferred than high forest, where they are seldom if ever met with.

The species is much less secluded in its habits than the generality of serpents, and will be more frequently observed in exposed places in the daytime than other forms, though the greater part of its activity is exercised at night, as is customary in the group. As a fact, much of the security of man as against snake-bite is due to the nocturnal habits of these creatures, owing to which they are not frequently brought in contact with man in the retired places which they seek out from daylight.

Little is known of the breeding-habits of these creatures. From actual cases which have been under observation, it seems likely that the number of young produced at one time is about from twenty to thirty—twenty-three, twenty-four, and twenty-two being the numbers in three cases.

The rattlesnake reaches a length of from 5 to 6 feet, and the adult females are peculiarly stout.

In many of its characters the bushmaster or Coonocooshi (*Lachesis mutus*) closely resembles the rattlesnake. The ground-tint, however, is reddish or maize-coloured, while the rhombs, which are elongated and irregular, are of a deep chocolate or purplish black. The tail is terminated by a conical spine replacing the rattle, and its under surface is covered with small scales instead of the ordinary posterior shields. The gape is marked by a black streak, and the shield above the eye (supraocular) is small and narrow compared with the width of the head.

This snake is certainly the giant among vipers, a specimen 14 feet in length having been taken in the Colony by Mr. John Junor. Specimens of from 8 to 12 feet are by no means uncommon, especially in the higher districts of the north-west, where they seem to be much more common than elsewhere. It is certainly the species that is most feared locally, being credited with the habit of attacking people whenever met with. This, however, is not the case, for in the writer's experience they have always remained as though asleep, and even on disturbance merely raised the head, darting out the tongue, as all these pit-vipers do, unless the disturbance be of a more or less violent kind. From the size to which it attains the bushmaster is, however, justly entitled to the dreadful reputation which it bears.

Under "Occasional Notes" in a former number of 'Timelri' an incident is narrated on the authority of Mr. Barnard, the well-known American mining expert in the Colony, of one of these snakes being observed to give out from its mouth, after being severely wounded, a number of small young specimens. Mr. Barnard asseverates that there was not, nor could there have been, any possible mistake of the anus for the mouth, the snake being directly observed in the water when it was struck. Since then another incident of the same kind has been observed by him, also in the Upper Mazaruni districts, and, there being no mistake, these incidents would seem to show that young vipers do at times take refuge in the mouth of their parent, however unlikely it may appear.

The labarria (*Lachesis atrox*) includes not only the commonly known form which passes under this name in the Colony, but also the fer-de-lance and the jararaca, which are evidently but varieties of one and the same widely distributed species.

Like the bushmaster, they possess a terminal horny spine and a black streak from the eye to the angle of the mouth; but the underside of the tail bears no small scales replacing the subcaudal shields, and the supraocular shield is large. The head, too, is much more sharply pointed, with distinct raised edges, the part anterior to the eye forming almost a neat triangle, and the scales are imbricated, being more elongate than tuberculate.

The colour of this species is very variable, ranging through grey, brown, reddish, and yellow, or a mixture of them. The rhombs are sometimes represented, but always faintly so—triangular spaces, outlined by paler or darker streaks, and with the apices above, being the most common—or the body may be simply spotted or slashed with lighter or darker tints. The underside may be uniform, or spotted, or blotched and

speckled. In very young specimens the end of the tail is yellowish white from birth and the general marking is much deeper and richer than in the adults.

Full-grown specimens reach a length of about 5 feet, the females being much stouter in proportion than the males. The number of young at a birth, from observed cases, appears to range from twenty to thirty, as in the rattlesnake; but the young labarrias are much smaller in proportion, corresponding to the markedly thinner build of the body in the two species.

As already mentioned, this is the commonly distributed forest- or bush-viper. Many harmless colubrine snakes and some of the boas, which possess some resemblance to it in markings, are frequently mistaken for it—mistakes that are very likely to be confirmed in the mind of the observer by the fact of the more or less severe pain and swelling which temporarily follow the bite of many of the colubrines with elongated and enlarged posterior teeth. One of these latter (*Helicops angulatus*) goes by the common name of water-labarria, and on this account bears an unjustly bad reputation.

The three vipers above described are strictly terrestrial forms, but the green labarria (*Lachesis bilineatus*) is an arboreal species with prehensile tail. The body is uniformly green or spotted and speckled with black, and is marked on the outer scales with a yellow lateral line or series of spots. The end of the tail is red.

This species, which reaches a length of from 3 to 4 feet, does not appear to be common, or it well may be that it is not frequently observed owing to its green colour; and there are consequently but few cases of its being taken. Several green and harmless colubrines, and even the green boa, are generally mistaken for it, and they all appear to be designated "parrot"-snakes on account of their colour. The finely-scaled head with raised anterior edges, the loreal pit, the viperine fangs, and the other crotaline characters, however, will easily serve to distinguish it.

The remaining venomous species all belong to the genus *Elaps*, which is the American representative of that section of the Colubrina to which the cobra and the greater number of the Eastern venomous serpents belong. In them the anterior maxillary teeth are perforated fangs which are permanently erect, the jaw not hinging on the skull as in the viperine snakes.

As already stated, only one of these species, the largest (*Elaps surinamensis*), is really to be dreaded; in the Colony it goes by the common name "Himeralli," and attains a

length of 6 feet. They are found along the waterside on the great rivers and along the sheltered creeks, and are thus not easily secured.

The species will readily be recognized by its red colour and by the black and yellow rings, the black being arranged in threes, with the central one very broad in comparison with the other two, each set of three separated from the others by a broad band of red, and each one ring of the set from the next by a band of yellow. The red scales of the head also are black-edged and give a very peculiar appearance to the species.

Two other common species (*Elaps corallinus* and *Elaps lemniscatus*) will readily be recognized by the arrangement of the black and red bands. In the latter the black rings are in sets of three separated from each other by narrow yellow or whitish spaces, and each set of three from the next set by red bands, which are usually wider than the others.

In *Elaps corallinus* the black and red bands are more or less regularly arranged, the black being edged with yellow, and the red spotted with black. These species reach a length of 3 to 4 feet, *E. lemniscatus* being at times longer and comparatively thick.

They are both found in moist grassy places, more especially by the trenches and creeks and in swampy lands. They pass usually under the common name of "coral"-snakes, and are frequently confounded with red and black banded harmless species, such, for instance, as *Erythrolamprus aesculapii*. In all the venomous species the eyes are very small and can hardly be distinguished, while in the others they are large and prominent; and this serves as a rough and ready means for the identification of the two groups.

Though capable of inflicting severe injury, if not death, on man, no case has ever come under the writer's notice in which such results have been experienced. Frequently these snakes will be seen being carried about by children and others who have not the faintest suspicion of the risk they run; and even when irritated it is generally a difficult matter to get them to open their mouths.

A fourth and rare small species (*Elaps psyches*) will at times be met with. It may well be called the pigmy coral-snake, since it seems never to exceed a length of about $1\frac{1}{2}$ feet. It will readily be recognized by the alternate black and reddish-brown rings, which are separated by narrow yellowish rings. The head, too, is black, and is marked on each side by a small yellow spot. From the rareness of its

occurrence this form may practically be disregarded in the enumeration of the venomous species.

It should be noted in connexion with these banded or coral-snakes that a very great deal of variation characterizes the greater number of species, and though they have been grouped under many different names, it can hardly be doubted that many of them will have eventually to be placed together. The four here mentioned are definitely well-marked forms.

LVII.—*Diagnoses of new Species of Land-Shells from the Islands of Flores, Sumbawa, and Sumba.* By EDGAR A. SMITH.

Ariophanta sumbawana.

Testa depresso globosa, anguste umbilicata, dilute olivaceo-fuscescens, zona indistincta pallida prope medium cincta, linea rufa ad peripheriam ornata; spira breviter conoidea, ad apicem obtusa; anfractus sex, superiores parum convexiusculi, lineis incrementi obliquis curvatis aliisque spiralibus minute grano-decussati, ultimus levior, inflatus, subtus nitens, haud descendens; apertura obliqua, late lunata, intus albido-cærulescens, linea rufa dimidiata; peristoma tenue, margine columellari albo, leviter incrassato, ad insertionem expanso, reflexo, umbilicum semi-obtegente.

Diam. maj. 43 millim., min. 34; alt. 27.

Hab. Sumbawa, 4000 feet.

Both the upper and lower surface of the body-whorl exhibit faint spiral striæ, which do not, however, produce fine granulation as on the upper whorls. Closely allied to *Nanina arguta*, Pfr., from Java, but more finely sculptured and more rounded at the periphery and banded.

Rhysota peramœna.

Testa depressa, inflata, anguste umbilicata, tenuis, pallide fusco-olivacea, apicem versus purpureo-rufescens, circa medium anfr. ultimi linea rufa cincta; spira convexa, brevis, obtusa; anfractus $5\frac{1}{2}$, lineis incrementi obliquis arcuatis, striisque spiralibus confertis subgranose cancellati, superiores vix convexiusculi, sublente accrescentes, ultimus magnus, inflatus, convexus, haud descendens, circa umbilicum haud granulatus; apertura obliqua, latissime lunata, intus sordide cærulescens, in medio uni-zonata; peristoma tenue, margine columellari prope insertionem reflexo et dilatato, dilute corneo.

Diam. maj. 41 millim., min. 33; alt. 26.

Hab. South Flores, at 3600 feet.